STUDIES OF LEPTOSPIROSIS IN NATURAL HOST POPULATIONS: I. SMALL MAMMALS OF WAIPI'O VALLEY, ISLAND OF HAWAI'I*

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The small Indian mongoose (Herpestes auropunctatus), Carnivora: Viverridae, and the roof rat (Rattus rattus) and Polynesian rat (Rattus exulans), both Rodentia: Muridae, are abundant in Waipi'o Valley, island of Hawai'i. Two other murid rodents, the house mouse (Mus musculus) and the Norway rat (Rattus norvegicus), are sporadic or rare in occurrence. As carriers of serotypes of bacterial leptospires (Leptospira), which are transmissable to man, this assemblage of alien mammals is of public health significance and numerous cases of leptospirosis have been traced to the valley. Population density of the mongoose was estimated at 2.3 per acre; for rats it fluctuated seasonally from 1 to 11 per acre. The serotypes L. icterohemorrhagiae and L. sejroe were found in the mongoose in a 40:60 ratio. Of 33 house mice tested, L. ballum was isolated from 21 and L. icterohemorrhagiae from 2. One isolation of L. icterohemorrhagiae was made from 4 Norway rats examined. For 126 roof rats tested, 68% of adults and 26% of young were infected; and for 175 Polynesian rats, 34% of adults and 26% of young were infected. L. icterohemorrhagiae made up 95% and L. ballum the remaining 5% of infections in the roof rat. For the Polynesian rat the ratio was 75:25. Free-ranging rats under observation for as long as 8 months acquired or lost infections. The wet subtropical climate of Waipi'o Valley supports conditions for transmission of leptospirosis even in times of drought. No prominent differences were observed in the infection rates in the lower valley at 30 feet above sea level and 1.7 miles inland at 120 feet. In the forested watershed of the valley rim at 3000 feet, conditions of infection matched closely those on the valley floor. Tests of 152 water samples from streams, ponds, and taro paddies resulted in isolations only of saprophytic leptospires.

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